

REMARKS/ARGUMENTS

Favorable reconsideration of this application in view of the present amendment and in light of the following remarks is respectfully requested.

Claims 1-10 are pending. Claim 7 is withdrawn. In the present amendment, Claims 1, 4, and 5 are currently amended, and new Claims 8-10 are added. Support for the present amendment can be found in the original specification, for example, at page 7, line 9 to page 9, line 19, and in original Claim 1. Thus, it is respectfully submitted that no new matter is added.

In the outstanding Office Action, Claims 1-6 were rejected under 35 U.S.C. § 103(a) as unpatentable over Akahori (U.S. Patent No. 6,443,165) in view of Ohmi (U.S. Patent Publication No. 2003/0178144) and Fong (U.S. Patent No. 5,882,414).

In response to the rejection of the claims under 35 U.S.C. §103(a), and in view of the present Amendment, Applicants respectfully request reconsideration of this rejection and traverse this rejection, as discussed below.

Amended Claim 1 recites, in part:

“(d) after the step (c), by supplying a cleaning gas containing oxygen and hydrogen into the processing chamber and radiating the microwave from the planar antenna member to activate the cleaning gas, cleaning inner surfaces of the processing chamber including a bottom surface of the dielectric plate with oxygen active species and hydrogen active species generated from the cleaning gas; and

(e) after the step (d), by supplying the film forming gas into the processing chamber and radiating the microwave from the planar antenna member to activate the film forming gas, forming a precoat film of fluorine-containing carbon on the inner surfaces of the processing chamber including the bottom surface of the dielectric plate with active species generated from the film forming gas.”

In accordance with the features recited in Claim 1, it is noted that the pre-coating process (described in step (e)) as well as the cleaning process (described in step (d)) are conducted for each substrate on which the fluorine-containing carbon film forming process is

performed. Therefore, in case a number of substrates are sequentially subjected to the fluorine-containing carbon film forming process, the thickness of the precoat film formed on the inner surface of the processing chamber is uniform regardless of the number of substrates to be processed, thereby obtaining a thickness uniformity for the film between the plurality of substrates which are sequentially subjected to the fluorine-containing carbon film forming process.¹ This is because the precoat film attached absorbs the microwave, and the absorption amount corresponds to the thickness of the precoat film and affects the thickness uniformity in surface of the film.² It is respectfully submitted that the cited references do not disclose or suggest each of the features recited in amended Claim 1.

Specifically, Akahori describes a method for cleaning a plasma treatment system for carrying out the plasma treatment of a substrate to be treated. The Office Action asserts on page 4 that Akahori describes the claimed cleaning step being performed for each substrate at col. 3, lines 52-54. However, Akahori fails to teach that the precoat step (the claimed step (e)) follows said each cleaning step for each substrate. Further, Akahori does not disclose or suggest any motivation for uniformly forming the thickness of the precoat film regardless of the number of substrates to be processed. Further, it is respectfully submitted that Ohmi and Fong do not cure the above-noted deficiencies of Akahori with respect to Claim 1. Accordingly, it is respectfully submitted that the combination Akahori, Ohmi, and Fong do not disclose or suggest each of the features recited in amended Claim 1. Thus, it is respectfully requested that the rejection of Claim 1, and all claims dependent thereon, be withdrawn.

Claims 4 and 5 recite, in part, “by supplying a gaseous mixture of an oxygen-containing gas and a rare gas into the processing chamber and radiating the microwave from

¹ See the original specification, at page 12, line 23 to page 13, line 7.

² See the original specification, at page 28, lines 6-24.

the planar antenna member to activate the gaseous mixture, oxidizing the surface of the gas supply member with oxygen radicals generated from the gaseous mixture.” It is noted that this oxidizing step recited in Claims 4 and 5 is different from the claimed cleaning step. First of all, the claimed oxidizing step is applied to the surface of the gas supply member, while the cleaning step is applied to the unwanted film formed on the surface in the processing chamber. Further, this oxidizing step is performed by using a gaseous mixture of an oxygen-containing gas and a rare gas, while the cleaning step is performed by using a cleaning gas containing oxygen and hydrogen.

By the oxidizing step, an oxide film having a high adhesivity is formed on the surface of the gas supply member. This prevents a substrate from being contaminated by a scattering of the gas supply member’s material, in case the gas supply member is made of aluminum or an aluminum alloy. Further, the rare gas penetrates into the oxide to suppress a film stress in the oxide film, so that a high adhesivity can be obtained.³

However, Akahori, Ohmi, and Fong do not disclose or suggest the aforementioned feature of the present invention. It is respectfully submitted that the Office Action with respect to the rejection of Claims 4 and 5 cites portions of Akahori and Fong which discuss the cleaning step, not the oxidizing step, which are distinguished from each other, as discussed above. In addition, with respect to Claim 5, the cited references do not disclose that the oxidizing step is performed for each substrate. Thus, the combination of Akahori, Ohmi, and Fong does not disclose or suggest each of the features recited in Claims 4 and 5. Therefore, it is respectfully submitted that amended Claims 4 and 5, and all claims dependent thereon, are allowable.

New Claims 8-10 are added by the present amendment. Support for new Claims 8-10 can be found in the original specification, for example at page 7, line 9 to page 9, line 19.

³ See the original specification at page 12, line 3 to page 13, line 16 and at page 30, line 26 to page 31, line 19.

Thus, it is respectfully submitted that no new matter is added. New Claims 8-10 depend on Claims 1 and 5, and are believed to be patentable for at least the reasons discussed above with respect to Claims 1 and 5. Accordingly, it is respectfully requested that new Claims 8-10 be allowed.

Consequently, in view of the present amendment and in light of the above discussions, the outstanding grounds for rejection are believed to have been overcome. The application as amended herewith is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact Applicant's undersigned representative at the below listed telephone number.

Respectfully submitted,

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